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The experience of quantitative assessment of relief influence on the urban building aeration

Kharchenko S.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

Buildings aerating features arc one of important characteristics of urban environment. The CFD method (realized in the UrbaWind software) was used for quantitative assessment of relief (topographic) influcncc on the aeration of urban residential zones. The necessary stage of CFD-modcling is creating of geometrically correct image of real landscape. The model must include Earth surfacc, buildings and main groups of trees. Modeling need such input data as digital elevation model (DEM), digital buildings model and field ancmomctrical data (for verification of computer simulation results). Then these results analyzed by methods of mathematical statistics. The assessment of topography influcncc on the aeration of two residential areas was implemented: 1) for group of urban square with different number of storeys to north from historical ccntcr of Kursk including the part of Kur River's valley; 2) for one urban square on leveled surfacc of Tuskar∗ River's floodplain. The influcncc of topography on the aeration of residential sites is possible to define by comparison of wind field characteristics by different directions for two conditions: ideal flat topography and real topography. The comparison is convenient to realize by Pcarson-corrclation (coefficient) of pairs of mean speed values in the same points of model. On the whole, the minimal values of R arc inherent to the more topographical dissectcd area (site Jfsl). By some directions the minimal values of R arc inherent 1) to general aspect of Earth surfacc on the site; 2) to aspect of the most sloped area - fragment of crosional scarp of Kur River valley in the shape of cirquc. The morphology of Earth surfacc even in plain environment influences on the urban area aeration.

Keywords

Aeration of residential zone, Assessment, CFD-modcling, Urban area relief